

several of these cases where the conditions produced an ascites in which the fluid was bile stained; when this condition is present, it may be by mistake treated as cirrhosis of the liver.

Another point that Dr. Cooper did not mention is the presence of a gumma compressing the bile ducts. Only recently I saw a case in which the diagnosis had been made by the family physician, Dr. Eidenmuller, who diagnosed lues and gall-bladder disease. A gumma was found compressing the bile ducts; gall-stones were also found, but the syphilis was the cause of the icterus.

Another condition simulating gall-bladder disease may proceed from the appendix. Occasionally one may encounter an appendix associated with leukocytosis, as high as 90 per cent. polys being found; icterus may also be present. When the abdomen is opened the gall-bladder is found to be normal and the removal of the appendix does away with the icterus that may have been present for a long time.

Regarding the surgical aspect of gall-bladder disease, Dr. Terry stated that he employed gauzes moistened with alboline which prevents their being saturated with the escaping contents of the gall-bladder.

My practice is to use dry compresses made by covering sheet wadding with gauze; if this sort of a pad is used 2 or 3 will do more towards packing away the intestines than a greater number of pads will accomplish.

Concerning the character of the incision to be made, in my opinion there is only one kind of an incision to make and that is a big one, large enough to easily expose the pathological conditions.

The so-called Elliott position in which the pillow is placed under the back is often productive of subsequent backache, more particularly in elderly people, and should be avoided if possible.

There is only one point in connection with the treatment of pancreatic disease, and that is the surgical treatment, and the following case is worthy of mention:

A number of years ago I was in Boston at the time when Mikulicz visited the Massachusetts General Hospital, where a case had been operated by Dr. C. A. Porter, who discovered an acute pancreatitis when the abdomen was opened. The pancreas had the appearance of a sausage and there was a question in Dr. Porter's mind as to what should be done; he made an incision through the capsule which extended from the head to the tail of the pancreas; he then drained the wound. Mikulicz at the time thought that the prognosis was absolutely bad, but the patient eventually recovered.

The treatment of pancreatic disease has not developed particularly since that time so that it is well to bear in mind the manner in which this particular case was treated.

Dr. E. H. Schneider, Los Angeles: I wish to say a few words in regard to cicatricial stenosis occurring at the junction of the cystic and hepatic ducts following cholecystectomy for stone in this region. The jaundice which is due to cicatricial stenosis occurs within a couple of weeks following operation. It comes on without any pain, progressively deepens, later is accompanied by edema and anasarca and practically always proves fatal within three years.

I have seen three such cases. Exploration in all three cases did not occur until nine months to one and one-half years after the jaundice had occurred. Operation showed the common duct to be not much more than a fibrous cord due to extension of the cicatrix and a non-use atrophy. I would therefore advise that a jaundice appearing without pain within a few weeks after a cholecystectomy should be reoperated early in order that this condition may be recognized and remedied before it is too late.

Dr. C. M. Cooper, San Francisco: I would only say that I think Dr. Levison should report those cases in which the gall-stone was present in the common bile duct and pressed upon the portal vein thus causing ascites. I have seen only one suspicious case myself and the literature contains but few references to such a condition.

Dr. W. I. Terry, San Francisco: In regard to Dr. Rixford's statement about the position, I should have spoken of the flexed position. Dr. Rixford has done a good deal in devising a table which makes access very easy in certain cases.

THE WORK OF THE PASTEUR DIVISION OF THE STATE HYGIENIC LABORATORY.*

By J. C. GEIGER, M. D., Chief Bacteriologist, Bureau of the Hygienic Laboratory of the California State Board of Health, Berkeley.

In an article written in 1910, Black and Powers¹ reported a small outbreak of rabies among dogs in Los Angeles in 1898. They also reported a fatal human case in Pasadena in 1899 and another outbreak of rabies among dogs in the Soldiers' Home near Los Angeles in 1906. In Stimson's report on Rabies,² published in 1910, California was declared to be one of the states that was free from the disease. In 1909 the present epidemic began to attract attention and two articles by Sawyer^{3,4} show the spread of the disease up to April 1, 1912. The spread of rabies has been continuous and rapid throughout the state. The toll of human deaths has been 18 and the loss of valuable live stock has been considerable. Organized efforts have been made to check its progress, but the lack of co-operation on the part of the county officials, and a bitter opposition from other sources, have greatly retarded the work so far. The presence of rabies in any given community will cause considerable excitement and the passage of numerous laws, which in time are forgotten. In presenting this paper, I am endeavoring to place before you reliable statistics of rabies as it now exists in California. These statistics are based on actual work done by this division of the State Hygienic Laboratory. It must not be forgotten that diagnostic and other work in rabies is also done by municipal and private laboratories. For instance, the laboratory of the San Francisco Board of Health has made 277 positive examinations from April 1, 1912, to April 1, 1913. Five of the animals affected were persons, 259 were dogs, 4 were cows, 2 were horses and 8 were cats.

RESULTS OF LABORATORY EXAMINATIONS.

Beginning April 1, 1912, and ending March 31, 1913, 322 examinations of the brains of animals for rabies have been made in this laboratory. Of these specimens, 7 were in such a state of decomposition as to make examination impossible. 36 brains gave negative results and 279 were found positive. 252 of the positive cases were diagnosed by the finding of Negri bodies, and the balance by inoculation into rabbits, guinea-pigs and a monkey. Of the animals affected, 4 were human, 6 were cows, 10 were cats, 2 were goats, 3 were

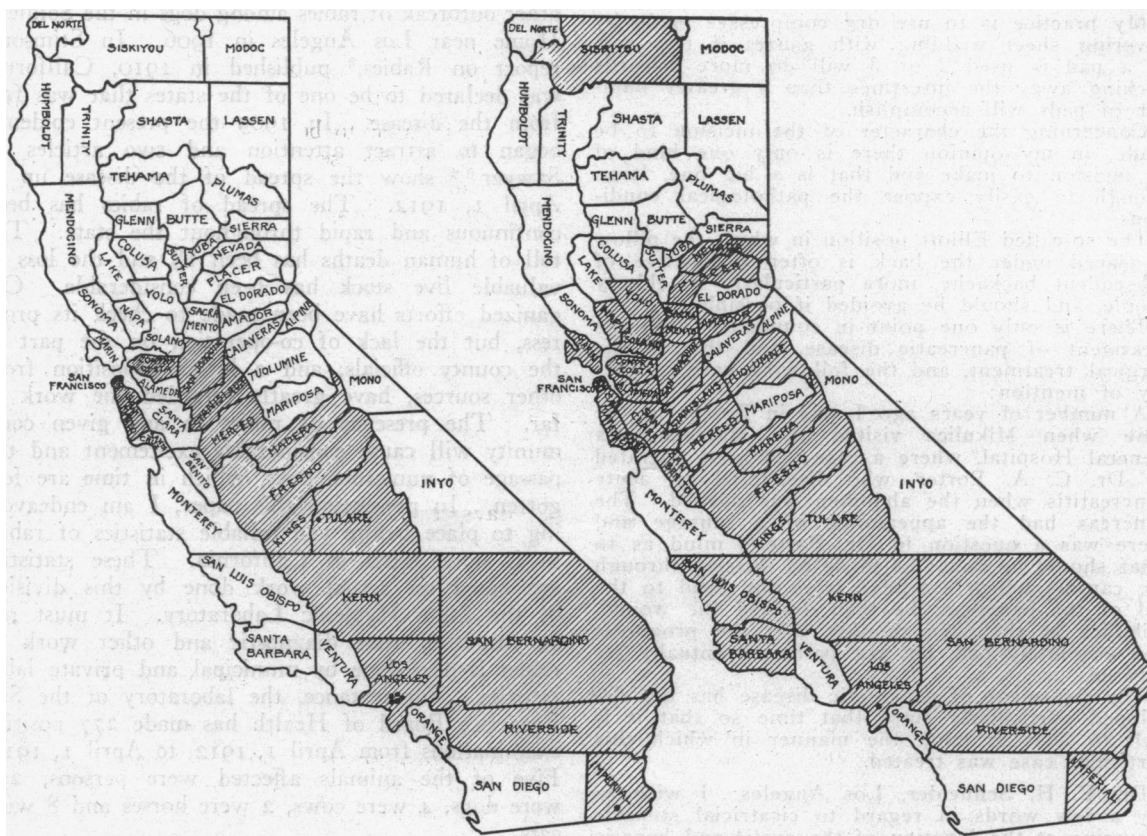
* Read before the Forty-Third Annual Meeting of the State Society, Oakland, April, 1913.

horses, 1 was a pig, 1 was a bull, and 252 were dogs. Within the period, no coyotes had been received, but since March 31st one has been examined at this laboratory and found positive for rabies. This is the only coyote head ever sent to the laboratory. We have received reports of the biting of 227 human beings and 234 animals by the animals proved positive by our examinations. As to months, 21 positive examinations were made in April, 30 in May, 14 in June, 12 in July, 19 in August, 15 in September, 19 in October, 30 in November, 36 in December, 22 in January, 28 in February and 33 in March. You can readily see that the examinations are very evenly distributed

proximately 176. The counties affected were as follows: San Mateo 45 positive cases, Sacramento 28, Marin 24, Fresno 21, Alameda 16, Tulare 16, San Joaquin 16, Stanislaus 14, Santa Clara 13, Kings 12, Napa 9, Placer 10, San Francisco 6, Contra Costa 6, Merced 5, Yolo 5, San Luis Obispo 4, Solano 4, San Bernardino 4, Tuolumne 3, Nevada 3, Riverside 2, Santa Cruz 2, Santa Barbara 2, Siskiyou 2, Kern 2, Madera 1, Los Angeles 1, Amador 1, Imperial 1, San Benito 1. This makes a total of 31 counties against 15 of last year.

The distribution of the cases by counties is shown on the accompanying maps.

CHART SHOWING INCREASE OF RABIES IN CALIFORNIA BY COUNTIES.



NOV. 2, 1909 TO MARCH 31, 1912

APRIL 1, 1912 TO MARCH 31, 1913.

EXISTENCE OF RABIES PROVED BY STATE HYGIENIC LABORATORY.
• HUMAN DEATHS FROM RABIES.

among the different months and that the belief in increased prevalence in summer has very little foundation in fact. The average temperature in California for December was 45° F. and our examinations for that month were 36, 3 more than for any previous month. In comparison to last year, the percentage increase of examinations giving positive results, as shown by our figures, is ap-

Adding to the 279 positive cases just reported, 277 positive cases examined by the San Francisco Board of Health and the 414 positive cases previously reported by Sawyer, we have a total of 970 cases for the present epizootic, without including the work done during the past year by a number of private and municipal laboratories.

DIAGNOSIS OF RABIES.

The technic of making the diagnosis of rabies is a very simple one. Smears are made from parts of the hippocampus by pressing some of the tissue between glass cover slips and drawing it out, using slight pressure. The smears are dried and stained with fuchsin and methylene blue by the method of Williams. The basis of a positive diagnosis is the finding of Negri bodies or the production of characteristic symptoms in inoculated animals. The presence of Negri bodies is sufficient proof of rabies, but the inability to detect them should not be taken as conclusive evidence that the disease is absent. Our experience shows that, even with considerable familiarity with the technic of examinations for Negri bodies, we are unable to place absolute reliability on the negative results of microscopical examinations. Inoculation should always be performed as a check on these negative results. It has always been the rule in this laboratory to inoculate animals when we cannot demonstrate the presence of Negri bodies, and our results have shown this to be not only sound practice but a necessary procedure. Since the beginning of examinations for rabies in this laboratory, excluding from consideration all specimens that did not arrive in good condition, 424 positive examinations were made and 49 of these, approximately 8½ per cent., were found negative on prolonged microscopical examination but proved positive on inoculation. Inasmuch as Negri bodies are not found in approximately one-twelfth of the positive examinations, a negative microscopical examination is no proof of the absence of the disease. Therefore, when a person is bitten, and the laboratory makes a provisional negative report based on microscopical examination, it is necessary for the physician to decide at once regarding treatment, considering the symptoms of the animal at the time of biting and any other evidence he may have at hand. All animals suspected of having rabies, when it can safely be done, should be put under observation for at least 10 days. The killing of the animal may obscure the diagnosis for weeks, as we may not be able to demonstrate Negri bodies by microscopical examination. According to our records, animals suffering with rabies die, as a rule, within four to six days of the first symptoms noticed.

RESULTS OF ANIMAL INOCULATIONS.

A very satisfactory method of diagnosing rabies is by animal inoculation. Inoculation is the final test for determining the diagnosis when Negri bodies cannot be detected on microscopical examination. Two methods are in common use; subdural and intra-muscular. Variations in the incubation period are frequent in both methods. Rabbits and occasionally guinea-pigs are the animals used in this laboratory. When the condition of the brain permits, the subdural method is preferred. By this method, the earliest time in which we have had a rabbit come down with the disease has been 15 days and the longest 91 days, an average of 45 days for 13 rabbits. For guinea-pigs, the earliest was 13 days and the longest 30, days, an average of 27 days for 5 guinea-pigs. The intra-

muscular method is advisable when the crushing of the brain has permitted contamination with pathogenic organisms. The brain is kept in glycerin for 48 hours, and is then ground up with physiological salt solution and injected, in doses of ½ to 1 cc., into the muscles of the animal's neck. By the latter method, the earliest time for rabbits to come down with rabies has been 12 days and the latest 60 days, an average of 30 days for 10 rabbits. The earliest time for guinea-pigs inoculated intra-muscularly to come down was 18 days and the latest 31 days, an average of 25 days for 6 guinea-pigs.

RABIES IN MAN.

Sawyer's summary of the human cases of rabies in California showed that up to March 31, 1912, there had been eleven cases. From April 1, 1912, to March 31, 1913, there were seven cases of rabies among human beings reported in California. The seven cases are as follows:

1. E. H., a man, age 69, died of rabies on June 2, 1912, in San Francisco.

On April 28, 1912, this man was bitten by a dog which was at large on the street in San Francisco. The right wrist was bitten severely on both sides. He did not begin treatment until May 3, five days after he was bitten. He took the "mild" treatment, without interruption, at the San Francisco Health Department. Treatment was finished on May 23. The virus used throughout the treatment had been secured by the State Board of Health from the Hygienic Laboratory of the U. S. P. H. and M. H. Service in Washington.

During the treatment there were no unusual symptoms. The patient was an old man who seemed rather feeble. There were no severe reactions to the treatment. During Monday, May 27, four days after finishing the treatment, the patient complained of continuous and rather severe pain in the upper part of the right side of his back and in his right shoulder. The pain extended down his right arm but was less severe and less constant there. The patient, as has already been stated, had been bitten in his right wrist. In the evening the patient was slightly delirious.

On June 1, 1912, Dr. Kellogg of the San Francisco Health Department saw the patient. At that time there were no characteristic symptoms of rabies. On the day of his death, according to his wife, he would be thrown into a "kind of chill" when swallowing fluids. On autopsy, portions of the brain tissue were examined at the laboratory of the San Francisco Health Department, and Negri bodies were found. A rabbit inoculated intracranially with an emulsion of the brain tissue came down with characteristic symptoms of rabies, which confirmed the diagnosis from microscopical examination.

2. A. B., a girl, aged 6 years, died of rabies on July 15, 1912, in Los Angeles. She had been severely bitten in the right cheek on May 27 by a dog which made its escape and was not seen again. The wound was cauterized. When seen on July 14, forty-seven days later, she had a temperature of 102° and a rapid feeble pulse. Her

face wore an expression of terror and any attempt to drink threw her into convulsions. The condition grew worse and she died the following day. We are indebted to Dr. Frank F. Clair, the attending physician, for our information.

3. J. J. R., a man about 60 years old, died of rabies on July 20, 1912, in San Francisco. This patient was bitten on June 18th by his own dog, which, judging from symptoms, was rabid at the time. The wound was on the left thumb, at the root of the nail. The patient left the wound untreated, not suspecting rabies in the dog. There were no symptoms until four weeks after the bite. The patient complained of pain in his right arm and chest. He was very restless and was unable to sleep at night. The symptoms increased, and on the fifth day of his illness the patient found that he could not swallow and complained of spasms, especially of his abdominal muscles. His breathing was difficult and the slight excitement of attempting to move about caused muscular spasms and great agitation. Noises bothered him greatly. He objected to taking fluids and almost jumped out of bed when they were offered to him. The patient died on the sixth day of his illness.

A portion of a hippocampus was examined at the laboratory of the San Francisco Health Department, and another part was sent to the State Hygienic Laboratory. Prolonged microscopic examination, at the State Hygienic Laboratory failed to reveal the presence of Negri bodies. An emulsion of the tissue was inoculated intracranially into a rabbit and into a guinea-pig on July 22d. The guinea-pig sickened on July 31st and died on August 4th, thirteen days after inoculation. The rabbit sickened on August 6th, and became paralyzed and died on August 8th, seventeen days after inoculation. The brain of the rabbit was examined microscopically and many typical Negri bodies were found.

4. F. O., a boy, age 16 years, died of rabies on July 22, 1912, in San Francisco.

The patient was bitten in the left hand by a cocker spaniel. All traces of the dog were lost. The wound was cauterized, but the Pasteur treatment was refused.

On Friday morning, July 19, 1912, 78 days after the biting, the patient complained of a headache and of feeling as though he had "the grippe." The next morning he was noticed to be breathing very deeply. He slept throughout the following night, according to the father's testimony, but in the morning (Sunday) he was worse. He was very restless and complained of drafts. He seemed highly sensitive to sounds and air currents. He showed great aversion to drinking water and said he could not drink and that his throat hurt. He explained that the act of swallowing did not actually hurt, but that he could not get the fluids down. His hands shook and he was extremely nervous. He was highly excitable and slightly delirious. The breathing was very irregular and rapid. The pupils were widely dilated and reacted slightly to light, but the patient was annoyed by the light given off by a match.

The patient stated that he was thirsty but could not drink. He objected to being offered a large glass of water, but he would swallow a little water, with great difficulty, from a small glass. The sight of a glass of water brought on increased irregularity of breathing. The pulse was fair, running between 80 and 90, and the temperature was about 99° F. He expectorated large quantities of saliva and was conscious up to three minutes before death.

At the State Hygienic Laboratory a microscopical examination of the hippocampus was made, but no unquestioned Negri bodies could be found. Some of the tissue was inoculated into two rabbits, and both came down with characteristic symptoms, and examination of their brains showed many Negri bodies.

5. M. J. S., a woman, age 37 years, died of rabies November 23, 1912, in San Francisco. This patient had been bitten on her left hand by a stray dog, two months before. Her first symptoms appeared after a severe fall. She complained of shooting pains in her left arm. Swallowing was painful and the patient was markedly susceptible to external stimuli such as drafts of air. The patient was very restless and could not sleep. After death, portions of the brain tissue were sent to the laboratory of the San Francisco Board of Health and Negri bodies were demonstrated. A rabbit inoculated with some of the same material came down with characteristic symptoms of rabies.

6. S. N., a boy, age 10, died of rabies in Sacramento, December 9, 1912.

There was no history of a bite. On December 6th the patient complained of sore throat and of pains in the muscles of his neck and in his epigastrium. His speech was altered. There was a large amount of muco-purulent secretion in his mouth. The patient was very restless and could not swallow fluids offered him. After death a portion of the brain was removed and sent to the State Hygienic Laboratory. Microscopical examination of smears from the hippocampus showed a few typical Negri bodies. Animal inoculation with some of the brain tissue proved this case to be rabies.

7. N. C. O., a girl, age 6, died of rabies on February 1, 1913, in San Francisco.

This patient was bitten by her own dog three weeks before the onset of the disease. The dog disappeared. The patient had difficulty in swallowing and a few slight convulsions. She was very nervous. There was excessive salivation, dilated pupils and some symptoms of beginning paralysis of the muscles of respiration. Examination of the brain after death at the laboratory of the San Francisco Board of Health and at the State Hygienic Laboratory showed the presence of Negri bodies. Subsequent animal inoculations proved the disease to have been one of rabies.

THE PASTEUR INSTITUTE.

The California State Board of Health passed a resolution on May 18, 1912, authorizing the State Hygienic Laboratory to manufacture antirabic virus. Previous to this, all virus used had been

obtained from the Hygienic Laboratory of the U. S. Public Health Service in Washington. On June 3, 1912, Dr. Donald H. Currie of the U. S. P. H. and M. H. Service, inspected the Pasteur Institute and approved of the equipment and methods in use. Since that date all virus used by the laboratory has been of its own manufacture. Under date of October 14, 1912, license No. 40, for the manufacture of antirabic virus, was issued by the U. S. Treasury Department to the State Hygienic Laboratory. This license was not necessary for the use of virus within the state but was an additional evidence of the safeguards used in the manufacture.

The treatments are administered by the State Hygienic Laboratory in Berkeley and at its branches in Sacramento, Fresno and Los Angeles; also by deputized bacteriologists in the City Health Departments of San Francisco, Sacramento and Los Angeles, and in the Letterman General Hospital at the Presidio of San Francisco. All treatments are administered free of charge, subject to the approval of the local health officer and the Secretary of the State Board of Health. The chief facts regarding the Pasteur Institute during the past year are shown by the following tables:

TABLE 1.

PASTEUR TREATMENTS BY THE STATE HYGIENIC
LABORATORY USING UNITED STATES GOVERN-
MENT VIRUS.

April 1, 1912, to May 22, 1912.

Where and by Whom Administered.	Number of Cases..	Deaths Treatments not Completed	Diagnosis in Biting Animals Based on			
			Inoculation ...	Observed Symptoms ...	History	Suspicious History
City Board of Health, San Francisco, Cal.....	46	0	1	35	3	7
City Board of Health, Los Angeles, Cal.....	1	0	0	1	0	0
City Board of Health, Sacramento, Cal.....	0	0	0	0	0	0
Letterman General Hos- pital, Presidio, San Francisco	4	0	0	4	0	0
San Joaquin Valley Branch, Fresno, Cal...	2	0	0	2	0	0
Northern Branch, Sac- ramento, Cal.....	4	1	0	4	0	0
Southern Branch, Los Angeles, Cal.....	0	0	0	0	0	0
State Hygienic Labora- tory, Berkeley, Cal.....	7	0	0	6	1	1
	64	1	1	52	4	8

The 269 people who were treated with virus obtained from this Institute came from the several counties as follows: San Francisco 150, Alameda 20, Sacramento 19, Los Angeles 19, Placer 10, Fresno 8, Merced 5, San Joaquin 5, San Mateo 5, Stanislaus 5, Marin 4, Santa Clara 3, Yolo 3, San Luis Obispo 3, Napa, 2, Tuolumne 2, Tulare 1, Santa Cruz 1, Contra Costa 1, San Benito 1, emergency request from Oregon State Board of Health 2. This does not represent the total number of people given the antirabic treatment in this state, as many patients were treated by their physicians with virus purchased from commercial laboratories. The infection came from the bites of dogs in 243

instances and in 10 cases from the bites of cats. Two persons were exposed to rabid horses, and one to a rabid cow. Two cases were inoculated from a human case. In one instance by a bite from the patient, and in the other from an accident during the autopsy. Six persons took the treatment as a precaution against exposure while doing laboratory examinations for rabies. Five persons took the treatment because of contact with human cases of rabies. The longest delay before beginning treatment was 79 days. There was also one delay of 60, one of 53 and 2 of 48 days. Excluding these extreme figures, the length of time between the biting and the beginning of treatment ranged from 1 to 32 days, and averaged 6 days.

The Pasteur treatment is not entirely devoid of danger nor is there any specific contra-indications for its use. Of its efficiency there can be no doubt. Remlinger⁵ found the percentage of failures, in 131,579 cases, to be only 41 hundredths of 1 per cent. The ill effects resulting from the treatment during the year under consideration were very few.

TABLE 2.

PASTEUR TREATMENTS BY THE STATE HYGIENIC
LABORATORY USING STATE VIRUS.

May 23, 1912, to March 31, 1913.

Where and by Whom Administered.	Number of Cases..	Deaths Treatments not Completed	Diagnosis in Biting Animals Based on			
			Inoculation ...	Observed Symptoms ...	History	Suspicious History
City Board of Health, San Francisco, Cal.....	95	1	0	75	8	12
City Board of Health, Los Angeles, Cal.....	16	1	0*	13	3	0
City Board of Health, Sacramento, Cal.....	12	0	0	9	3	0
Letterman General Hos- pital, Presidio, San Francisco	4	0	0	2	2	0
San Joaquin Valley Branch, Fresno, Cal...	14	0	0	13	1	0
Northern Branch, Sac- ramento, Cal.....	22	0	0	18	3	1
Southern Branch, Los Angeles, Cal.....	1	0	0	0	0	1
State Hygienic Labora- tory, Berkeley, Cal.....	39	4	0	36	2	1
State Board of Health of Oregon. Emer- gency request	2	0	0	2	0	0
	205	6	0*	168	22	15

* 1 death from myocarditis.

There was a certain amount of local reaction, occurring usually after the first week's treatment, and most marked between the 7th and 11th days. This was sometimes accompanied by malaise and slight elevation of temperature. There was usually swelling, redness, and some itching at the point of inoculation. In two instances subcutaneous abscesses developed. The only serious complication reported was a unilateral facial paralysis, which developed on the 17th day of treatment. The patient's condition has steadily improved, but there are some traces to be found nine months afterward. One boy developed a fever which lasted a week, but probably had no relation to the treatment. An exact diagnosis of the sickness was not made. One man, who was seriously ill and practically bed-

ridden in a hospital with a chronic affection diagnosed as myocarditis, died from that disease on the second day of treatment. There appears to be no possible connection between the treatment and the patient's death.

The question comes up as to who shall receive the Pasteur treatment. Any person who has been bitten by a rabid animal, or who has fresh open wounds or scratches contaminated with the saliva of such animals, should receive the treatment. The possibility of danger from the milk of rabid cows is remote, since inoculation from the sound digestive tract does not take place. Persons bitten by animals showing suspicious symptoms should have the animal put under observation for 10 days, whenever possible. Though rabies among animals is very prevalent in California, human deaths will be exceedingly few if the rules here laid down with regard to the methods of diagnosis in animals and the prompt treatment of human beings, are followed.

REFERENCES.

- 1 Black, S. P., and Powers, L. M., *Cal. State Journal of Medicine*, Nov., 1910, Vol. VII, pp. 369-372.
- 2 Stimson, A. M., *Bull. 65, Hyg. Lab., U. S. Public Health & Mar. Hosp. Serv., Wash.*
- 3 Sawyer, W. A., *Rabies in California*, *Cal. State Jour. of Medicine*, July, 1911, Vol. IX, pp. 294-298.
- 4 Sawyer, W. A., *Rabies and its Present Status in California*, Aug., 1912, Vol. X, pp. 318-329.
- 5 Remlinger, P., *Antirabic Vaccination*, in "Bacteriotherapy, Vaccination, Serotherapy," edited by Gilbert and Carnot, pp. 76-127.

COMMENTS ON TUBERCULIN.*

By JNO. C. KING, M. D., Banning.

The program demands from me a paper on tuberculin tests. Such a paper would be largely academic, mere quotation from so-called authorities. With your permission, I will, instead, endeavor to give a rambling talk on certain phases of tuberculin that have impressed me in my daily work. No man has any right to express an opinion upon a subject he has not investigated. My interest in this subject dates from Koch's first announcement, because I was then suffering from tuberculosis. Experience soon convinced me that tuberculin was too dangerous for me to use in general practice. For some years I wrote and spoke against it. About fifteen years ago I began to restudy it and to use it—cautiously. I have always been prejudiced against its use, but for a long series of years I have made from 7,000 to 10,000 injections annually. Regarding many points connected with it I have been unable to arrive at definite conclusions. Some few questions I have definitely settled in my own mind.

To those interested I wish to recommend two books, recently published. One is a special plea for the use of tuberculin in treatment; written by one of the most enthusiastic advocates of the remedy, our own Pottenger. The other, by Hamman and Wolman, of Johns Hopkins, presents a judicial view of our present knowledge of tuberculin, and will bear reading and rereading.

The friends of tuberculin advise its use for three purposes, diagnosis, prognosis and treatment.

A fourth purpose, prophylaxis, has been more recently emphasized; notably by Von Ruck and Friedman. This prophylactic idea is by no means new. The present theory is that inoculation of very young children, prior to infection, will prevent infection. Obviously, this is the most important purpose to which tuberculin can be put. So far, the preparation to be used, the methods and conditions of use, the repetition of dose and other essential problems are embryotic in the minds of the pathfinders. Obviously, too, the value of any method of prophylaxis can only be determined after a lapse of twenty or thirty years.

My time limit precludes reference to other than salient points. The various preparations of tuberculin now exceed one hundred. Their several originators laud them separately. The users of tuberculin prefer one or another, just as various syphilographers prefer different preparations of mercury. Those in common use are O. T., T. R., B. E. and, perhaps, I. K. and watery extract. I will premise three propositions, regretting lack of time to debate them.

1st. All forms of tubercle bacilli, human, bovine, avian, even those infecting cold-blooded animals and fish, are one. Their differences depend upon adaptation to environment. This function of adaptation is common to other forms of parasitic vegetable life.

2nd. All forms of tuberculin are one, no matter how prepared. Each of them must possess the elements essential to the production of a tuberculin reaction, otherwise it is not tuberculin.

3rd. The action of tuberculin is specific. That is, no reaction will ever occur, no matter what dose may be administered, unless the subject of that dose is tubercular. Please note this statement does not necessarily imply active tuberculosis.

Practically all my work is sent to me by other doctors. Some of them write that a given patient has or has not tuberculosis, because he has or has not reacted to some tuberculin test. None of them ever describe the symptoms of the reaction. Few of them name the test. The latter is important information; for instance, if the doctor has made the conjunctival test and has secured a reaction, a second application to the same eye might result seriously. Likewise, the dose given subcutaneously should be stated. Tuberculin tests are invariably given for diagnosis or prognosis. No test should ever be made for the former purpose when the diagnosis is obvious without the test. If T. B. can be demonstrated; if the physical signs are conclusive; if the lesion is manifestly tubercular to the eye, as in the larynx, there is no need of further evidence. The tuberculin test is not justifiable. If the diagnosis is doubtful further evidence is requisite. The tuberculin test, however, is not conclusive in these doubtful cases. It is not necessary to discover whether the patient has ever been infected. It is needful to know whether there is active disease, whether the condition existing is menacing and requires treatment. From sixty to eighty per cent. of adults have been infected but only a much smaller per-

* Read at the Forty-eighth Meeting of the Southern California Medical Society, May, 1913.